Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

CHEST 2021
ANNUAL MEETING | OCTOBER 17-20

Chest Infections

TOPIC: Chest Infections
TYPE: Original Investigations

THE ROLE OF ASCORBIC ACID IN REDUCING MORTALITY IN PATIENTS WITH SEVERE COVID-19 PNEUMONIA: A SYSTEMATIC REVIEW AND META-ANALYSIS

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PURPOSE: The use of ascorbic acid or vitamin C in patients with COVID-19 pneumonia is a topic of significant investigation. Some argue it decreases the rate of mortality in severe cases of COVID-19 pneumonia, while others argue that it provides no additional benefits to a patient's outcome. This literature review looks at patients with COVID-19 pneumonia, and investigates the role of high dose vitamin C (HDVC) in reducing mortality, length of intensive care unit (ICU) stay, and length of hospital stay.

METHODS: A thorough search of the literature was conducted to perform a meta-analysis of the available studies that compared the efficacy of HDVC to standard care or placebo in patients with severe COVID-19 pneumonia. This search was performed using PubMed, Embase, and Cochrane for data on the subject matter of study from inception to April 20, 2021. We considered randomized controlled trials, cohort studies, case-control studies, and case series. From each study, we collected the number of patients with severe COVID-19 pneumonia who underwent treatment with either HDVC or standard care/placebo. The primary outcome was the rate of mortality. Secondary outcomes were ICU length of stay and length of hospital stay. The random-effects model was used to calculate the risk ratios (RR), mean differences (MD), and confidence intervals (CIs). A p-value <0.05 was considered statistically significant. Heterogeneity was assessed using Higgins I2 index.

RESULTS: Three randomized controlled trials and one retrospective cohort study involving 290 patients were including in the meta-analysis. The rate of mortality was not significantly lower in those receiving HDVC when compared to standard care/placebo (7.3% vs. 13.7%, RR 0.60, 95% CI 0.27-1.36, p= 0.22, I2= 15%). Two studies reported the length of hospital stay, which was not significantly lower in those receiving HDVC when compared to the standard care/placebo group (MD= 0.22 days, 95% CI -0.14-0.59, p= 0.23, I2= 0%). Two studies reported length of ICU stay, which was found to be significantly higher in patients receiving HDVC compared to those receiving standard care/placebo (MD= 0.38 days, 95% CI -0.01-0.75, p= 0.04, I2= 0%).

CONCLUSIONS: Our meta-analysis demonstrates that the use of HDVC for patients with severe COVID-19 pneumonia does not significantly reduced the rate of mortality when compared to standard care/placebo. HDVC also does not did not significantly reduce the length of hospital stay and was in-fact found to increase the length of ICU stay. Further data should be collected to confirm our findings.

CLINICAL IMPLICATIONS: The use of HDVC for patients with severe COVID-19 pneumonia is not effective in reducing mortality, and may in-fact come at the cost of longer ICU stays for patients who receive HDVC rather than standard care.

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DOI: https://doi.org/10.1016/j.chest.2021.07.518